

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604

MAY 30 2013

MEMORANDUM

SUBJECT: Announced Inspection of ExxonMobil Joliet Refinery
Channahon, Illinois

FROM: Constantinos Loukeris, Environmental Engineer
Enforcement and Compliance Assurance Section (MI/WI)

Alexandra Letuchy, Environmental Engineer
Enforcement and Compliance Assurance Section (MI/WI)

THRU: Sara Breneman, Chief
Enforcement and Compliance Assurance Section (MI/WI)

TO: File

Facility: ExxonMobil Joliet Refinery

Location: I-55 & Arsenal Road
Channahon, Illinois 60410

Inspection Date: June 11 - 14, 2012

Inspection Team: Alexandra Letuchy, U.S. EPA Region 5
Constantinos Loukeris, U.S. EPA Region 5
Roshni Brahmabhatt, U.S. EPA Region 5
Raymond Cullen, U.S. EPA Region 5
Virginia Palmer, U.S. EPA Region 5
Michelle Heger, U.S. EPA Region 5

Facility Attendees: Terry J. Cirbo, Senior Environmental Advisor
Patrick W. Elder, LDAR Advisor
Elizabeth Ball, Environmental Engineer
Jeffrey L. Noga, Environmental Group Leader

Joe McHues, ARI Consulting
Brett Lardy, Environmental Engineer
Brad Kohlmeier, Environmental Engineer

Overview of Company:

ExxonMobil Joliet Refinery ("ExxonMobil" or "the facility") produces transportation fuels (gasoline and diesel), industrial fuels, and asphalts. The facility typically refines 245,000 barrels of crude oil per day. They operate 24 hours a day, 7 days a week.

Arrival to Facility and Opening Conference:

Prior to arrival at the facility, Constantinos Loukeris contacted Jeffrey Noga of ExxonMobil on June 8, 2012 to announce that an inspection was to take place the week of June 11, 2012. Mr. Loukeris stated that the primary focus of the inspection was Leak Detection and Repair (LDAR) as it applies to the refinery and that 3 Toxic Vapor Analyzer (TVA) 1000Bs would be brought on-site by EPA to conduct EPA Reference Method 21. Mr. Loukeris highlighted the need for the LDAR contractor to be available to confirm any leaks identified by EPA during the inspection. He also asked that a copy of the LDAR database be prepared for EPA to take at the end of the inspection.

Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmhatt, and Ray Cullen of EPA Region 5 arrived at the facility at approximately 9:20 am on June 11, 2012. After presenting our credentials to security and watching the safety video, we received our visitor passes and were escorted by ExxonMobil personnel to a conference room for the opening conference. We met Jeff Noga, Elizabeth Ball, and Patrick Elder briefly in the conference room. Before the opening conference, Van Holman led us through safety training from 10:00 – 10:40AM.

We began the opening conference at 10:50 AM with Patrick Elder, Elizabeth Ball, Joe McHues, and Brett Lardy. We stated that the focus of our inspection would be the LDAR program. Reviewing the LDAR program would include LDAR comparative monitoring at three to four of the process units and reviewing their facility-wide LDAR document. In addition, we requested a copy of the LDAR database and the history of leak rates at processes subject to the Consent Decree entered in 2005. Mr. Noga told us that ARI was the LDAR contractor at ExxonMobil.

Process Overview:

ExxonMobil briefly discussed the layout of the plant. The refinery operates a single train fluid catalytic coking unit. The facility has an alkylation unit that currently uses hydrofluoric acid. The facility has a large coker and high cracking capacity. There is one reformer, one catalytic cracker, and one coker. There are two gas plants, one with unsaturated gas and one with saturated gas.

ExxonMobil processes Canadian crude in a "just-in-time" process. Gasoline accounts for two thirds of the production. The facility has 600 ExxonMobil employees and 250 contractors.

LDAR Monitoring Records and Procedures:

After the process overview, we discussed the LDAR program. ExxonMobil provided a printout of leak rates by process unit for the period of January 1, 2010 through March 31, 2012. Upon review, we determined that we would start monitoring at the Sat Gas Plant (Unit 8). We later notified ExxonMobil that we would also monitor in the SHU (Unit 21) and the Spheres (Unit 40) process units.

We told ExxonMobil that we would start monitoring in the afternoon on June 11, 2012 and would continue monitoring until June 14, 2012. We stated that we would primarily be monitoring pumps and valves. We would either have the close out conference on July 14, 2012 in the afternoon or on July 15, 2012 in the morning. We also mentioned that we would bring an IR camera on June 14, 2012. We explained that each morning, we would provide ExxonMobil with a summary of monitoring completed the previous day.

LDAR Monitoring:

Attachments 1, 2, and 3 contain the monitoring results from the Sat Gas Plant, SHU, and Spheres Units, respectively.

LDAR Monitoring: June 11, 2012

EPA Inspectors Monitoring: Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmabhatt, and Ray Cullen

After lunch, we calibrated our TVA-1000Bs in the parking lot of the ExxonMobil Joliet Refinery. The calibration is performed at the following concentrations: a zero gas, 500 ppm, 2,000 ppm, and 10,000 ppm. Monitoring on June 11, 2012 took place only in the Sat Gas Plant (Unit 8). Tables A and B show the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring, respectively.

Table A. Leaks Over 500 ppm Identified at the Sat Gas Plant on June 11, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
08-01611	Valve	450	534	-
08-00446	Valve	844	834	-
08-03010	Valve	2351	1020	Previously tagged by ARI. Stem and packing insulated.
08-01196	Valve	1396	726	Previously tagged by ARI.

Table B. Leaks Over 200 ppm Identified at the Sat Gas Plant on June 11, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
08-02356	Valve	240	392	-
08-00914	Valve	370	322	-
08-00910	Valve	201	282	-

LDAR Monitoring: June 12, 2012:

EPA Inspectors Monitoring: Virginia Palmer, Shelly Heger, Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmhatt, and Ray Cullen

Monitoring on June 12, 2012 day took place in the Sat Gas Plant (Unit 8) and in the SHU (Unit 21). Tables C and D show the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring. There were no leaks over 200 ppm found at the Sat Gas Plant on June 12, 2012.

Table C. Leaks Over 500 ppm at the Sat Gas Plant on June 12, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
08-01648	Valve	5900	6581	-
08-01150	Valve	832	1008	-
08-00768	Valve	515	773	-
08-01781	Pump	2200	4243	Flame out on EPA instrument.

Table D. Leaks Over 500 ppm at the SHU on June 12, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
21-00506	Valve	620	220	Control valve, doesn't get a first attempt.
21-00689	Valve	608	555	Second TVA reading, 513.

LDAR Monitoring: June 13, 2012:

EPA Inspectors Monitoring: Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmhatt, and Ray Cullen

Monitoring on June 13, 2012 took place in the SHU (Unit 21) and the Spheres (Unit 40). Tables E, F, and G show the leaks over 500 ppm and over 200 ppm identified during the

EPA Method 21 monitoring. There were no leaks over 500 ppm identified at the SHU unit.

Table E. Leaks Over 200 ppm Identified at the SHU unit on June 13, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
21-00728	Valve	390	359	

Table F. Leak Over 500 ppm Identified at the Spheres unit on June 13, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
40-00842	Valve	507	540	
40-01878	Valve	1230	1152	
40-00168	Valve	512	614 (6/11/2012 reading)	Previously tagged.

Table G. Leaks Over 200 ppm Identified at the Spheres unit on June 13, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
40-01947	Valve	386	240	-
40-01578	Valve	225	-	-
40-00388	Valve	360	356	

LDAR Monitoring: June 14, 2012:

EPA Inspectors Monitoring: Shelley Heger, Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmhatt, and Ray Cullen

Monitoring on June 14, 2012 took place only in the Spheres (Unit 21). Tables H and I show the leaks over 500 ppm and over 200 ppm identified during the EPA Method 21 monitoring.

Table H. Leaks Over 500 ppm Identified at the Spheres unit on June 14, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
40-01306	Valve	498	1,513	
40-00424	Valve	1,360	1,761	
40-00201	Valve	613	676	
40-00415	Valve	536	563	

Table I. Leaks Over 200 ppm Identified at the Spheres unit on June 14, 2012

Component ID	Component Type	EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
40-00328	Valve	286	279	
40-00569	Valve	236	199	
40-01100	Valve	495	357	

EPA conducted a FLIR® infrared (IR) camera survey of the facility, including its flare to evaluate proper combustion. EPA recorded 7 IR videos and took 18 digital photos.

EPA Monitoring Summary for July 12-14, 2010:

Table J summarizes the results of the comparative monitoring performed by EPA for July 12 – 14, 2010.

Table J: EPA Valve Monitoring Summary

Unit	Number of Components Monitored	Number of Leaks Over 500 ppm Identified	Leak Rate (%)
Sat Gas Plant	649	7	1.08
SHU	400	1	0.25
Spheres	358	7	1.96

Additional Leaks Found During Monitoring

In addition to LDAR comparative monitoring, we also monitored plugs, connectors, carbon drums, visual leaks, and sampling points that were around or interfering with monitoring at valves or pumps. Table K shows leaks greater than 500 ppm, on component types, excluding valves and pumps.

Table K. Other Equipment Greater Than 500 ppm

Component ID	Component Type	U.S. EPA TVA Reading (ppm)	ARI TVA Reading (ppm)	Notes
08-01181	Plug	35,000	100	Visual leak. ARI reading after first attempt. Interference with valve reading.
08-02748	Plug	545	640	
40-01207	Plug	1,0000	249,000	
40-01799	Plug	9,500	34,500	
40-00845	Plug	10,000	Confirmed	
40-03245	Plug	10,000	10,000	
21-00906	Plug	6,203	10,700	
21-00999	Connector	3650		
21 - Carbon Drum North	Carbon Drum	620		
21- Carbon Drum South	Carbon Drum	480		
40-01497	Plug	480		

In addition, during EPA's monitoring, EPA observed several valves that required periodic monitoring; however, due to insulation, proper Method 21 monitoring at the surface of the interface where leakage could occur, as required in Section 8.3.1. of 40 C.F.R. Part 60, Appendix A, EPA Reference Method 21, was not possible. Table L shows the valve tag numbers that could not be monitored properly due to insulation.

Table L: Insulated Valves

Unit	Component ID
Sat Gas Plant	08-03010
Sat Gas Plant	08-02691
Sat Gas Plant	08-02757
Sat Gas Plant	08-02750
Spheres	40-00363

Records Review: June 14, 2012

We started a records review at 1:00 pm. We reviewed the facility-wide LDAR document, the LDAR quarterly LDAR audits, LDAR training, and SHU Oily Water Sewer Sump Level compliance reports. We also reviewed the LDAR database.

Closing Conference: June 14, 2012

EPA Inspectors Attending: Shelley Heger, Alexandra Letuchy, Constantinos Loukeris, Roshni Brahmhatt, and Ray Cullen

ExxonMobil Staff Attending: Jeff Noga, Patrick Elder, Joe McNugh, Terry Cirrow, Brad Kohlmeier, Elizabeth Ball, and Brett Lardy

We started the closing conference at 1:45 pm. During the closing conference, we pointed out areas of concern that we found during the inspection: open containers for purges, loose plugs, SHU canisters emitting pollutants (VOCs and/or HAPs), insulated valves, and the inclusion of valves in the LDAR program that are only used occasionally for flaring.

We stated that no compliance determinations are done on-site; the records we retrieved, along with any additional records we may request through a Section 114 letter, will be reviewed to determine compliance status.

Records Retrieved (via hard copy):

1. Consent Decree Stipulated Penalties Paid by ExxonMobil (as of June 14, 2012)
2. Listing of process unit numbers and associated process unit name
3. Picture of the SHU process unit carbon canisters (#1 and #2) [Claimed Confidential]
4. Inspection Sign-In Sheet for the following: June 11, 2012 through June 14, 2012
5. Valve and Pump monitoring and leaker data by ExxonMobil from 1st Quarter 2012 through 2nd Quarter 2012

Records Retrieved (via compact disk):

1. LDAR Database
2. Process unit shutdown schedules from 2006 through 2011
3. Microsoft Excel spreadsheets with ExxonMobil's LDAR monitoring for all process units
4. 2006, 2008, and 2010 3rd party Consent Decree LDAR Audits
5. Semi-Annual Consent Decree reports for January 2011 through December 2012